Jan. 24, 1956 S. M. HEIDE 2,732,210

RACING GAME APPARATUS

Filed June 9, 1952 3 Sheets-Sheet 1

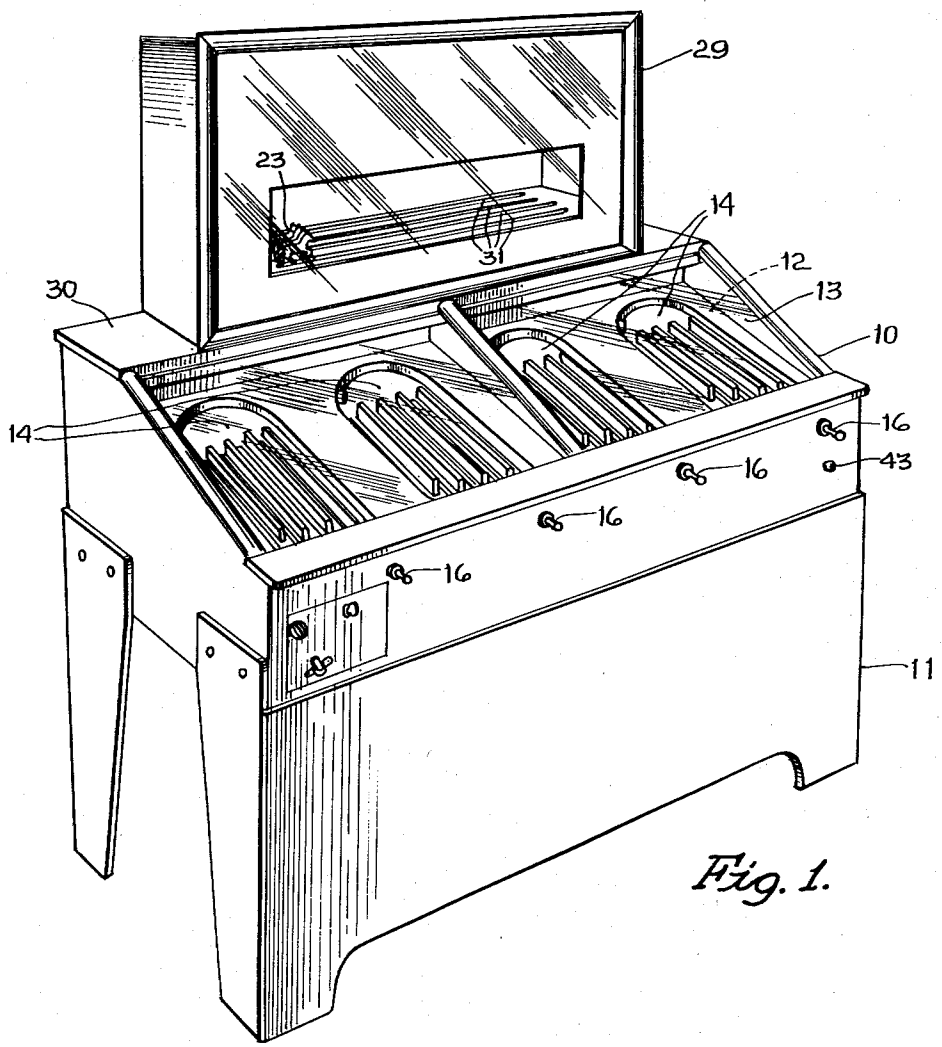


Fig. 1.

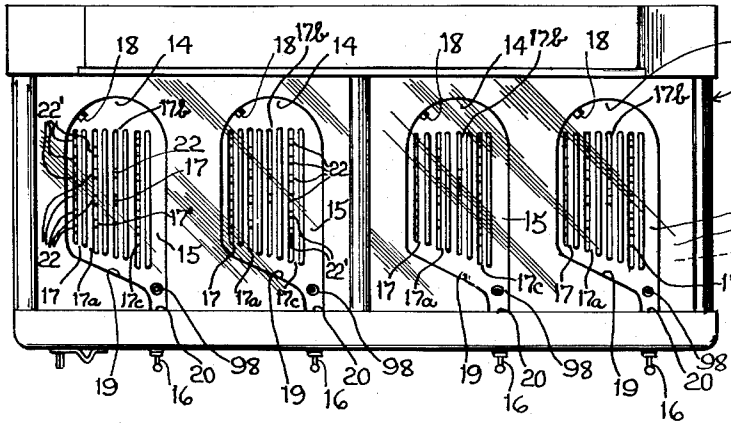


Fig. 2.

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RACING GAME APPARATUS

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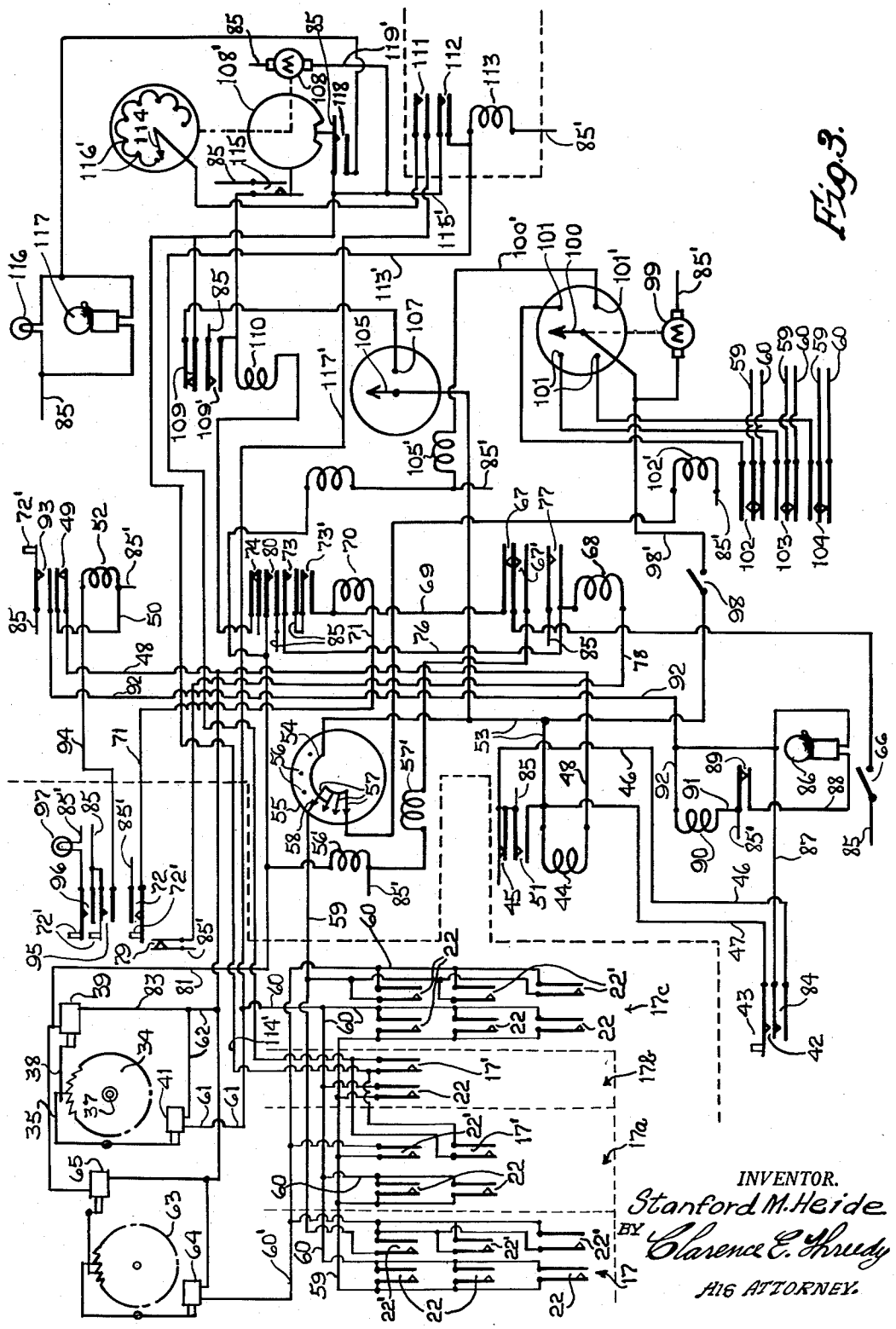


Fig. 3.

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RACING GAME APPARATUS

Filed June 9, 1952 3 Sheets-Sheet 3

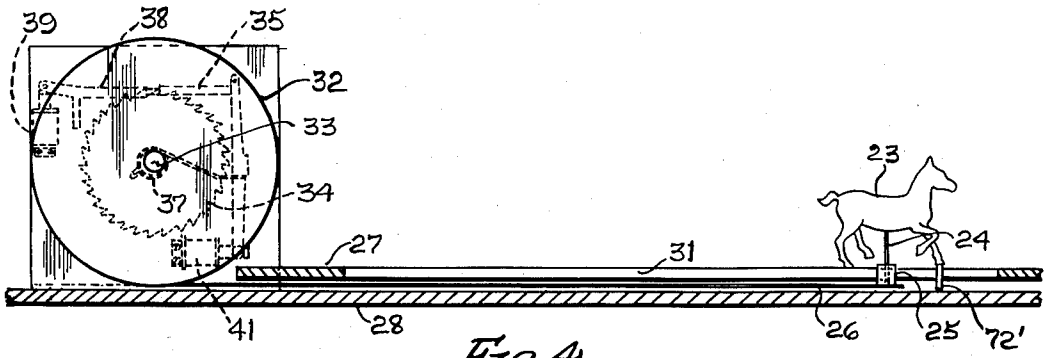


Fig. 4.

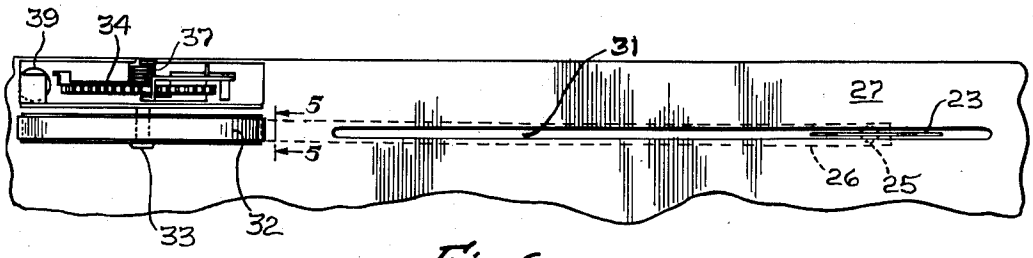


Fig. 6.

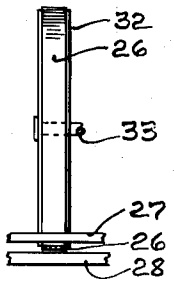


Fig. 5.

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United States Patent Office 2,732,210 Patented Jan. 24, 1956

2,732,210

RACING GAME APPARATUS

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Application June 9, 1952, Serial No. 292,473

2 Claims. (Cl. 273—86)

This invention relates to a racing game apparatus comprising a plurality of game units whereby to enable the game apparatus to be played by one or more players.

The object of the invention is to provide in such amusement game apparatus a plurality of objects such as race horses, automobiles or the like, which are adapted to be intermittently advanced from a starting to a finish position by the actuation of electrical apparatuses arranged in an electric circuit controlled by switches arranged in ball lanes or runways to be closed by the action of a moving ball.

Another object of such invention is to provide at the ball seat of a ball ramp an electric switch which controls the energization of a circuit hereinafter referred to as a sprint circuit, for intermittently advancing a horse or horses whenever such circuit is energized by actuation of a sprint motor plus the positioning of a ball on such ball switch.

In addition to the foregoing, it is also an object of this invention to provide a circuit for registering the results of the movement of the horses as and when the horse or horses arrive at the finish line.

Yet a further and equally important object of the invention is to provide an amusement game apparatus which, while constructed and designed for play by more than one player, is provided with a novel and simple arrangement whereby the game apparatus may be played by one player on the same basis as though the game was being played by more than one player.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of the invention;

Fig. 2 is a top plan view of the same;

Fig. 3 is a circuit diagram of one of the game units;

Fig. 4 is a part sectional detail view of the horse moving means;

Fig. 5 is a sectional detail view taken substantially on line 5—5 of Fig. 6;

Fig. 6 is a fragmentary top plan view of Fig. 4.

Referring more particularly to Figs. 1 and 2, my improved game apparatus comprises a main cabinet **10** mounted upon a suitable support **11**. This cabinet **10** is provided with a game board **12** arranged beneath a transparent top wall **13**. This game board is divided into a plurality of game units **14**. Each game unit comprises a ball ramp **15** through which a ball is projected by a conventional ball projector **16** to the upper end of the game board **12** for gravitation theredown through any one of a plurality of ball lanes **17**, **17***a*, **17***b*, and **17***c*. Each game unit further includes a bumper **18** against which the projected balls are adapted to strike and be deflected for movement into one of such lanes. The

game board **12** of each game unit **14** has a tapered wall **19** against which the ball strikes and is directed to the ball seat **20** just forward of the ball projector **16**.

Arranged in each of the lanes of each game unit **14** are ball roll-over switches over which the projected ball is adapted to roll on its return to the ball seat **20**. The switches indicated at **22** are connected in a circuit which controls the intermittent movement of a plurality of horses **23** or other objects, such as sulkies, automobiles, or the like.

The switches indicated at **22'** (Fig. 3) are connected in a circuit for controlling a plurality of switches incorporated in a sprint circuit. The switches indicated at **17'** are connected to a motor-controlled sprint circuit.

These various circuits will be presently described.

Each of the horses **23** is mounted upon a post **24** in turn fixedly inserted in a socket **25** secured to one end of a flexible belt **26**. This belt is preferably of flat spring stock and is confined for movement between spaced panels **27** and **28**, the panel **28** constituting the floor of a cabinet **29** mounted upon a top wall **30** of the cabinet **10**. The panel **27** is provided with parallel slots **31** through which the posts **24** project. The opposite end portion of each of the belts **26** is attached to a drum **32** mounted for rotation upon a shaft **33**. On this shaft **33** is mounted a ratchet wheel **34**. This ratchet wheel **34** is advanced step-by-step by means of a stepping pawl **35** actuated by a step-up coil **41**. The ratchet wheel **34** is held against rotation, by the action of a spring **37**, by means of a latch pawl **38**. This latch pawl **38**, while normally in engagement with the ratchet wheel **34**, is moved from such engagement by the action of a releasing coil **39**, to permit the ratchet wheel **34** to return to zero position by the action of the spring **37**. The latching pawl and step-up pawl **35** are interconnected in a manner well-known in the art, whereby when the latching pawl **38** is released, it acts upon the step-up pawl **35** to disengage such step-up pawl from the ratchet wheel **34** to permit the return of the ratchet wheel to zero position. Such an arrangement is disclosed in United States Patent No. 2,281,262.

Fig. 3 illustrates the electric circuit for each of the game units. As a preface to the description of this circuit, I wish to point out that while I have heretofore described and illustrated in the drawings an amusement game apparatus comprising a plurality of game units, designated at **14**, to enable the game apparatus to be played on a competitive basis by a plurality of players, it is clearly manifest that the game apparatus may comprise but a single game unit to be played by a single player.

Each of the game units comprises an electric circuit of the same arrangement for advancing the horses and for returning them to a starting position.

When the game apparatus comprises a plurality of game units, these circuits are arranged in a manner such as to be operated upon the playing of any one or more of the units simultaneously. This arrangement is controlled by what is hereafter referred to as the "player switch." For convenience, I have illustrated in the accompanying drawings of this application but one of such circuits. This circuit will now be described in detail.

It is, of course, obvious that at the start of a game, whether a single game unit or a plurality of game units, the horses should all be positioned at their starting line or position. This may be accomplished by releasing the various drums **32** to which the horse-carrying belts **26** are attached, thus returning the horses to starting position. As the circuit illustrated in Fig. 3 is described, it will be readily seen how this action takes place.

The horse **23** of each game unit **14** is advanced step-by-step along the simulated track **31**. Each horse is advanced by energization of its respective step-up coil

41. The circuit to such coil 41 is established in the following manner:

A starting switch 42 is closed by operation of a push button 43 located on the front wall of the cabinet 10. The closing of this starting switch 42 establishes a circuit to the starting relay coil 44. The circuit to the starting relay coil 44 is established from one side 85 of the power source through a normally closed switch 45, through a conductor 46, through the starting switch 42, conductor 47, through coil 44, conductor 48, to a normally closed game-over switch 49, and from thence to the other side 85' of the power source through a conductor 50.

When the coil 44 is energized, a normally open switch 51 is closed and serves as a holding switch to maintain the coil 44 energized until such time as the switch 49 is opened by energization of a game-over coil 52.

One side of the switch 51 by a conductor 53 is connected to a contact plate 54 of a "player switch" 55. This player switch 55 includes a plurality of contacts 56 adapted to be engaged by wiper fingers 57 which engage the contact plate 54. The contacts 56 are each connected to a game unit 14. The wiper fingers 57 are advanced by an advancing coil 57' in circuit with a switch 67' adapted to be closed simultaneously with switch 77 upon energization of a coin relay coil 68 hereinafter referred to. The wiper finger 57 is returned to starting position by a retainer coil 56' in circuit with a switch 89 hereinafter referred to.

I have shown the first of these contacts, indicated at 58, in circuit with the switches 22 of one of the game units 14. This is accomplished through conductors 59 connected to corresponding sides of the switches 22. The opposite sides of these switches 22 by conductors 60 and 61 are connected to one side of step-up coil 41. The other side of this step-up coil 41 by conductors 62 is connected to the other side 85' of the power source through conductor 48, normally closed game-over switch 49, and conductor 50.

This arrangement is such that when a ball passes over any one or more of the switches 22 while gravitating through the ball lane in which such switches are located, the closing of such switch or switches completes the circuit to the step-up coil 41 to advance the horse. This operation continues until one of the horses reaches the finish line. The registering of the advancement of the horses is achieved by the step-up unit 63 which has a rotatable wheel similar to the scoring indicia wheel of Patent 2,281,262 and which unit includes a step-up coil 64 and a release coil 65. The step-up coil 64 is connected in series with the step-up coil 41 so that each time a horse is advanced one step, such advancement will be registered.

The horses are reset or returned to their respective starting positions upon the commencement of a new game. In the present instance, the game is coin-controlled. Such an arrangement includes a coin-actuated switch 66, one side of which is connected to one side 85 of the power source. The other side of the coin-actuated switch 66 is connected to one side of a normally closed switch 67 of the coin relay coil 68. The other side of this switch 67 by a conductor 69 is connected to one side of a reset coil 70, the other side of this coil by a conductor 71 being connected to a normally open switch 72 having one side thereof connected to the other side 85' of the power source. This switch 72 is adapted to be closed when the horses take the first step away from the starting line, the switch 72 being held open by a depending arm 72' carried by each horse.

When the reset coil 70 is energized, switches 73 and 73' will be closed and switch 74 opened. The switch 73' is a circuit holding switch and when closed by the energization of the coil 70, it maintains a circuit to such coil. One side of the switch 73, as well as one

side of the switch 73', is connected to one side 85 of the power source. The other side of the switch 73 by a conductor 76 is connected to one side of a circuit holding switch 77 which, when closed, maintains the circuit to the coil 68. One side of this coil 68 by a conductor 78 is connected to a normally closed switch 79 which, like the switch 72, is controlled by the depending arm of the horse, and which switch 79 opens upon the first advancement of such horse. The energization of the coil 70 also closes an otherwise normally open switch 80, one side of which by a conductor 81 is connected to one side of a release coil 39 of the step-up 34. When this release coil 39 is energized, the drum 32 of such step-up unit 34 is released for rotation to zero or starting position under action of its spring 37. To complete the circuit to this coil 39, the other side thereof by a conductor 83 is connected to the other side of the power source 85' through the conductor 62, the switch 49, and conductor 50.

The arrangement is such that when the coin switch 66 is closed, a circuit will be completed to the release coil 39, thereby to release the drum 32 for rotation to zero or starting position, and in turn to return its respective horse to starting position with respect to the simulated track 31.

When the game is started, a bell control switch 84 will be closed simultaneously with the closing of the starting switch 42, to complete a circuit to a bell 86. The circuit to this bell 86, starting from the one side 85 of the power source, is through the normally closed switch 45, conductor 46, through the switch 84, conductor 87, to one side of the bell 86, and thence from the other side of the bell 86 through a conductor 88 to a normally closed switch 89, the other side of which is connected to the other side 85' of the power source. The opening and closing of this switch 89 is controlled by a coil 90, one side of which is connected by a conductor 91 to the other side 85' of the power source. The other side of this coil by a conductor 92 is connected to one side of a normally open game-over switch 93, the opposite side of which switch is connected to the one side 85 of the power source.

The arrangement is such that as the switch 84 is momentarily closed, the bell 86 will be energized. When the game is over by reason of a horse reaching the finish line, the switch 93 will be closed by engagement with a depending arm 72' carried by the horse. The closing of this switch 93 will energize the bell 86 at the same time that it energizes the coil 90, to open the switch 89 and thus interrupt the circuit to the bell 86. The switches 49 and 93 are opened and closed, respectively, by energization of the game-over coil 52. A circuit to this coil is from the other side 85' of the power source to the one side of the power source 85, through a conductor 94 and a normally open switch 95, which switch 95 is closed by the depending arm 72' of the horse as the horse reaches the finish line. Connected in series with this switch 95 is a normally open switch 96, which is also closed in a like manner and controls a winner score registering lamp 97 having one side connected to the other side 85' of the power source. By this arrangement, when a horse reaches the finish line, the depending arm 72' thereof will close the switch 96 to energize the lamp 97 to indicate a winner.

As previously pointed out, a single player may play the game by selecting as his horse one of the four horses and then proceed to play the game as though he were playing with competitive players. The coin switch 66 energizes each game unit 14 and all the horses thereof. The single player upon rotating this switch 66 proceeds to pick out one of the game units 14 as his own and then proceeds to play all the game units in turn. Thus the player playing the whole game has designated one horse as his and competes with himself and other horses of the game units 14. In order not to permit the horse

of the player's choice to constantly win, I have incorporated a method whereby each horse may be given a bonus sprint so as to win the race. This bonus sprint is beyond the control of the player.

To accomplish this, I have incorporated in the circuit an arrangement for advancing the horse of the game unit selected by the single player to be played. This circuit I refer to preferably as a sprint circuit, in that, as will be apparent, the horses will be caused to advance step-by-step in competition with each other. This is accomplished in the following manner:

In the projecting ramp **15** of each game unit **14** is arranged a normally open ball roll-over switch **98** which is closed by the weight of a ball thereon. When the ball is projected by the plunger **16** upwardly through the inclined ramp **15**, the switch **98** will be opened.

The sprint circuit to be presently described, and as hereinbefore indicated, is effective to advance a horse each time a wiper arm **105** engages a contact **107**. This wiper arm is advanced by an advancing coil **105'** similar to the coil **41** and arranged in a step-up **34**.

The circuit to this coil is from one side **85** of the power source through switch **51**, conductor **53**, through switch **98** (when closed by the weight of a ball thereon), wiper arm **100**, when engaging contact **101'**, through conductor **100'**, coil **105'**, to the other side of the power source **85'**.

The wiper arm **100** is actuated by a motor **99**. This motor is energized only when the ball switch **98** is closed by the weight of a ball thereon. The circuit to such motor is from one side of the power source **85**, through switch **51**, conductor **53**, switch **98**, conductor **98'**, through motor **99**, to the other side of the power source **85'**. The circuit through the wiper arm **100** and contact **101'** is completed only when switches **102**, **103** and **104** are closed. Switches **102** to **104** inclusive are in parallel through conductors **59** and **60** with the switches **22**. The switches **102** through **104** inclusive are closed upon energization of a relay coil **102'**. The circuit for this coil **102'** is from the side of the power source **85** through switch **51**, conductor **53**, player switch **55**, conductor **59**, switches **22'**, conductor **60'**, coil **64**, conductors **62** and **48**, switch **49**, to the other side **85'** of the power source through conductor **50**.

The motor **108** is initially energized upon the closing of switch **112**. This switch is closed by a relay coil **113**. The circuit to this coil **113** is from the side **85'** of the power source through coil **113**, conductor **113'**, through switch **17'**, conductor **114'**, to the side **85** of the power source.

The switch **112** is a holding switch to maintain energization of the coil **113** until the cam **108'** driven by the motor **108** has completed one revolution. This switch **112** is closed simultaneously with the closing of the switch **111**. The circuit to relay coil **113** through the switch **112** is from the side **85'** of the power source through the coil **113**, switch **112**, conductor **115'**, to the side **85** of the power source. The circuit to relay coil **113** is maintained through one revolution of the cam **108'**, driven by the motor **108**.

Such motor also drives a wiper arm **114**, and as this wiper arm **114** successively engages the contacts **116'**, a horse **23** will be advanced. The circuit to the horse-advancing coil **41**, under the above conditions, is from the side **85** of the power source through the arm **114**, when in contact with one of the contacts **116'**, switch **111** (which has been closed by energization of the relay coil **113**), conductors **117'** and **61**, through coil **41**, conductors **62** and **48**, through switch **49** to the other side **85'** of the power source through conductor **50**. Closing of the switch **118** will energize the light **116**.

After initial movement of the cam **108'**, the circuit to the motor **108** is from the side **85** of the power source, through conductor **119'**, switch **112**, and relay coil **113**, to the side **85'** of the power source.

A ball rolling down, say, for example, the ball lane **17***a*, will close the switches **22**, **22'** and **17'** in such lane. Closing of the switch **22** will directly energize the advancing coil **41** to advance a horse **23** one step. The closing of the switches **22'** energizes the score step-up unit **63**. The closing of the switches **17'** conditions the sprint circuit for energization if the wiper arm **105** thereof is on the contact **107**, at which time the motor **108** is energized through the circuit hereinbefore set forth and, through the normally closed switch **109**, sets up a circuit through switch **17'** in the ball lane **17***a*. The circuit through the switch **109** is deenergized by the energization of the relay coil **110** which, when energized, closes switch **109'**, thereby to maintain the coil **110** energized through the switch **74** as long as that switch is closed.

In summary, a ball closing any of the switches **22** will effect direct energization of the advancing coil **41** to advance a horse one step. A ball closing any of the switches **22'** will effect energization of the coil **41** provided that the wiper arm **100** is in contact with one of the contacts **101** and the switches **102** to **104** inclusive closed, as well as the switch **98**. A ball closing any one of the switches **17'** will energize the sprint circuit motor **108** and, if the wiper arm **105** is in contact with the point **107** when the arm **114** is in contact with one of the contacts **116'**, the advancing coil **41** will be energized to advance the horse as long as the arm **105** remains on the contact **107**.

I have by the foregoing provided an amusement game apparatus in which the game may be played competitively by a single player or by a number of players. The arrangement affords the maximum degree of amusement.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is:

1. A game apparatus which may be played by a single player or by a plurality of players, comprising a plurality of horses each carried at one end of a movable element and movable from a starting position in horizontal planes parallel with respect to each other to a finish position in said planes, electrically actuated means for advancing said movable elements and said horses step by step in said planes, an operating circuit for said electrically actuated means including ball-actuated switches and a starting switch, a circuit having a coin-actuated switch therein for conditioning said operating circuit for operation, means actuated by certain of said ball-actuated switches cooperating with the remaining switches of said operating circuit for conditioning a sprint circuit for energizing said electrically actuated advancing means independently of said operating circuit, a reset coil in said operating circuit for returning said horses to a starting position in said planes, said reset coil being in circuit with a holding switch and energized by said coin actuated switch for returning said horses to a starting position, said circuit holding switch and said reset coil deenergized by an arm carried by each of said horses when said horses return to said starting position, and means at the finish position in said planes and coupled with said operating circuit for deenergizing said operating circuit when one of said horses reaches said finish position by the actuation of said operating circuit or said sprint circuit, said last-named means including a normally open switch adjacent to said finish position in said planes so as to be closed by said arm carried by the first of said horses to reach said finish position.

2. A game apparatus which may be played by a single player or by a plurality of players, comprising a plurality of horses each carried at one end of a movable element and movable from a starting position in horizontal planes

parallel with respect to each other to a finish position in said planes, electrically actuated means for advancing said movable elements and said horses step by step in said planes, an operating circuit for said electrically actuated means including ball-actuated switches and a starting switch, a circuit having a coin-actuated switch therein for conditioning said operating circuit for operation, a step-up means for a movable element actuated by certain of said ball-actuated switches cooperating with the remaining switches of said operating circuit for conditioning a sprint circuit for energizing said electrically actuated advancing means independently of said operating circuit, a reset coil in said operating circuit for returning said horses to a starting position in said planes, said reset coil being in circuit with a holding switch and energized by said coin actuated switch for returning said horses to a starting position, said circuit holding switch and said reset coil deenergized by an arm carried by each of said horses when said horses return to said starting position, and means at the finish position in said planes and coupled

with said operating circuit for deenergizing said operating circuit when one of said horses reaches said finish position by the actuation of said operating circuit or said sprint circuit, said last-named means including a normally open switch adjacent to said finish position in said planes so as to be closed by said arm carried by the first of said horses to reach said finish position.

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